

DISCUSSION

UPON

THE DIAGNOSIS AND TREATMENT OF FOREIGN BODIES IN THE UPPER AIR-PASSAGES AND GULLET.

BRITISH MEDICAL ASSOCIATION MEETING, JULY 30TH, 1902.

Paper

READ BY

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THE DIAGNOSIS AND TREATMENT OF FOREIGN BODIES IN THE UPPER AIR-PASSAGES AND GULLET.

THE subject of our discussion might be opened in many ways, and the difficulty in making a choice is not lessened by remembering that it is one with which you, as laryngologists, are all familiar, and in which individually you have had great experience. Further, the consideration of foreign bodies in the upper air-passages and œsophagus has forced itself upon surgeons from all time. Its history—older by far than laryngology itself—has been well recorded, and the ordinary text-books in our special department, not to speak of works of those on general surgery and medicine, show how difficult it is to say anything new upon the subject.

Presuming, however, that, along with my distinguished colleague, Professor Killian, my duty is more to indicate leading lines of thought for discussion with profit, I will merely venture to lay before you some points of interest, in the hope that they may lead to that interchange of thought which is one of the advantages and justifications of such an assembly as this.

A review of recent literature shows that what advances have been made of late lie in the direction of diagnosis. This is by no means a slight advantage, because all our experience goes to show that here, as in every other branch of surgery, it is of vital importance to diagnose the presence of a foreign body, or to prove the existence of the same, at the very earliest moment possible. If, therefore, we have less to record in our recent literature by way of novelty in methods of treatment, if the principles are as old as that in any other branch of surgery, it by no means follows that the benefits to patients have not been enhanced. On the contrary,

recent instruments of precision have done much to enable us to make a diagnosis early, to localize with accuracy, to extract them more easily, and so much suffering is saved at the time of operation, while serious or dangerous sequelæ are less likely to follow.

The progress to which I refer has its origin, for the most part, in the great advances of physical science, which have been exercising, and which are daily more and more exercising, a powerful influence upon medical science. These may be divided into two kinds: Firstly, those depending upon methods of examination by the eye, largely due to improvements in methods of illumination, a more fitting example of which could not be found than in the work of Professor Killian in connection with bronchoscopy and œsophagoscopy; and, secondly, upon methods which are the direct outcome of the epoch-making researches in radiant matter, electric and other waves in ether, with which the names of Faraday, Hertz, Crookes, and Roentgen will ever be honourably associated.

The X Rays in Diagnosis of Foreign Bodies.—Remembering for a moment that, although we have had constant evidence in our literature of the value of X rays ever since the memorable discovery in 1895, this is the first opportunity that the section of laryngology of the British Medical Association has had of discussing their value in diagnosis of foreign bodies in the upper respiratory tract, and I therefore venture to refer to them in the first instance.

It may be well to state frankly at the beginning that here, as in all branches of surgery, they have their limits of usefulness. To begin with, the body may not be one which can be detected by the X rays; they may not be required, because one can see the foreign body by direct vision before and, what is still more important, at the time of the operation, but there are occasions and situations where nothing else will reveal the presence of a foreign body. Further, there are cases in which they give valuable assistance in diagnosis in combination with other methods.

I would here venture to say that it is doubtful if the X rays are even now fully appreciated, and this doubt is raised in one's mind by reading the reports of cases and the results obtained. It is only by experience one realizes what a delicate and valuable agent for the detection and localization of foreign bodies we possess. Some would almost lead us to believe that only large and hard bodies can be diagnosed by the X rays; on the contrary, very small objects can be seen, whether lying in deep cavities or buried in the tissues, when every other method fails. These results depend upon acquaintance with the normal appearance of the parts as seen on the fluorescent screen or on the negatives, as well as pathological

conditions, and likewise upon the application of the principles which underlie the differentiation of different objects of varying density, and the tissues themselves, such as those which reveal bone, cartilage, and muscle.

For the finest results the best apparatus is necessary; and I shall now throw a number of lantern-slides upon the screen, or show photographs or instruments, by way of demonstrating what has been found valuable in my own experience.

The first series of lantern-slides is intended to show the apparatus which I have found through experience to be useful in our special department. The coil, you will see, is a large one. We can change the primary to suit different conditions of self-induction, and, what is more important, large currents can be passed through the primary of the coil.

I use the mercury dipping interrupter, a rotatory form of the same, and the Wehnelt. Sometimes one is more suitable for a particular part of the body than another, or it may be that one is more useful at times for screen-work than photography.

I have devised a special switchboard, by means of which any one of these interrupters can immediately be changed. Again, the table has been specially arranged so that the Crookes' tube can be placed below or above it, and, by means of a reflecting mirror, one can see the object the whole time it is being photographed. Further, the foreign body itself—in some instances, at least—can be seen while it is being extracted.

The fluorescent screens should be of the very best make, and small ones can be introduced into the mouth by methods which I described three or four years ago, so as to reveal the presence of foreign bodies in the antrum or tissues of the neck.

The tube is of the greatest importance; one like Queen's or Müller's, with arrangements for changing the vacuum and keeping it at the same for a period, is the best. With such apparatus as I have described, provided there is an ample supply of current well controlled by rheostats, one can arrange for different densities of tissues or of the objects themselves. I will show you on the screen a number of photographs illustrating the different parts of the larynx, including cartilages and muscles.

The next series of lantern-slides and photographs represents the great advantages to be derived from stereoscopic vision, and where we wish accuracy and a good idea of the position of a foreign body, with its relation to surrounding tissues, there is no comparison between the ordinary photograph and the stereoscopic one.

Lastly, thanks to the work of Payne, Barrell, Remy, Shenton,

Mackenzie Davidson and others, accurate localization of a foreign body, if it be in the tissues, is possible.

In their proper place, therefore, my experience has been such as to enable me to say without hesitation that the X rays are of the greatest value; that the care and trouble necessary to obtain the very best results amply repay one. We have now reached a position in which, in many cases at least, one can not only obtain a positive result, but with confidence can assert that the foreign body is not present. I do not wish for one moment to undervalue Professor Killian's methods, because, after his brilliant demonstration to-day, it would be impossible to do so, but each has its place. In certain cavities of the body direct vision is not possible, and if the foreign body be buried in the tissues, then the X rays only may be able to reveal its presence.

Electro-Magnet for the Extraction of Foreign Bodies.—The extraction of some metallic foreign bodies by means of electro-magnet force has long been known to oculists. Some years ago the idea suggested itself to me that the same agent might be employed, to a certain extent at least, in the upper air-passages, and experimentally I was able to satisfy myself of this in the nasal and oral cavities. The instrument at my disposal was a very imperfect one, and it was only recently that I have had an opportunity of resuming experimental research on similar lines and on a more extended scale. I was further stimulated in this direction by the suggestive paper of Dr. Roaldes in the *Transactions* of the American Laryngological Association for 1901. In a thoughtful and suggestive paper this author deals with a subject which is at present largely experimental; but it begins by reference to one by Dr. Garel, of Lyons, who successfully employed such an instrument in the case of a child eighteen months old, who had swallowed a large nail. The radiograph showed the presence of a foreign body in the right bronchus, about the sixth intercostal space. The operator had decided to perform tracheotomy and to try to dislodge the nail by means of forceps, but, before employing these, he placed the point of an electro-magnet used in eye affections in front of the tracheal wound, and to his astonishment the nail was dislodged, being attracted to the magnet. The foreign body was rusty, measured 53 millimetres in length, and passed through a distance of not less than 6 centimetres.

The instrument which I have constructed for this purpose will be understood from the lantern-slide projected upon the screen. It consists of a special metal stand 6 feet high, with a cross-bar at the top. This can be turned round the central portion easily by

means of ball bearings, and at each end is a wheel, in the groove of which a strong iron rope passes. To one end of this the magnet is suspended, and to the other is attached a counterpoise. Further, the magnet is held in its position by a horse-shoe metal bar, permitting of movement in any direction. By this means at the bedside the magnet can be applied to and passed over any part of the body, as the free movement and exact counterbalance of weights enable one to pass it over the surface of the trachea with perfect ease. The magnet itself consists of a large bar electro-magnet with charcoal iron core 20 inches long and 4 inches in diameter. It has 6,000 turns of twenty S.W.G. copper wire, on metal bobbins carefully insulated with mica. It is excited by connecting it to the 250-volt main. Across the turns of the magnet a 32-candle-power lamp is placed, so as to save risk to insulation from self-induction when breaking the current. To the end of the bar different points can be attached of various shapes. Some forms of these I am also showing on the screen.

Notwithstanding the enormous power which this instrument can exert, it is only fair to speak of its possibilities. Although it exerts great power when applied to large para-magnetic bodies, still, its influence diminishes greatly when it is applied to a small surface of metal. Further, its magnetic power diminishes very rapidly as the distance from the foreign body increases, and, lastly, bodies must be free to move within the cavity.

That it is useful in the nose and pharynx I have already satisfied myself. That it may be useful in the trachea and bronchial tubes can scarcely be doubted where tracheotomy has been performed, and this, indeed, has been proved by the clinical case related above, and by experiments on the cadaver. The possibility of passing it over the surface of the chest so as to dislodge a metallic body and bring it up to the region of the larynx without tracheotomy suggests to one's mind the possibility of retaining it there by the same force, and by passing another point into the pharyngeal cavity we might extract the metallic body *per vias naturales*. This is as yet purely a matter of speculation, but the subject is worthy of consideration and further experiment.

Electro Esophageal Probes.—Most of you are more or less familiar with the various electric instruments which have been in use in recent years for the detection of bullets and other metallic bodies in different parts of the body. One of the best known is the electric bullet-finder, which consists of a telephone probe. Its action depends on the fact that, two different metals having a difference of potential, the telephone easily makes us conscious of a

current set up in this way. I have adopted this plan, and, instead of using an ordinary probe, a modified œsophageal metal-tipped bougie is passed into the œsophagus. A portion of a thin silver or other metal sheet is put in the patient's hand or laid on any part of the body. The bougie itself consists of a flexible copper wire covered with a non-conductor, and when the metallic point comes in contact with the foreign metallic body the fact is easily conveyed to the ear by means of the telephone, which is kept applied to the ear. To a certain extent, therefore, this acts in the same way as Duplay's œsophageal resonator, but the detection of the body does not depend upon striking it, only contact is necessary.

With a view to enlarging the scope of the discussion, I shall now throw upon the screen a number of lantern-slides, a few diagrammatical, but the most of them X-ray photographs, to illustrate cases of interest in the different parts of the upper respiratory tract; these are selected cases from many such which have come under my observation. The first photograph represents a silver tube, the lip of which having come off, the former slipped into the antrum of Highmore. The patient had been operated upon several years before in Paris. The accident settled a question which the patient had been debating in her mind for a considerable time, as I operated from the front through the canine fossa. The tube was extracted, the cavity curetted, an opening was made into the nostrils as well, with the most satisfactory results. The second photograph represents a case of long-continued suppuration of the right nostril. The patient, aged fifty, had been struck with pieces or splinters of wood three months before, and this had caused a deep injury internally. Although the external parts had healed, a small splinter was found in the anterior part of the ethmoidal cells. After removal complete recovery followed. The third and fourth photographs represent the one a shot and the other a bullet in the pharynx near the region of the tonsils. The fifth slide represents the position of a needle which an insane girl, aged fifteen, had pushed through the base of the tongue. While examining the larynx, a slight prominence was noticed in the front of the neck, but nothing could be seen inside. Pressure of the finger on the base of the tongue pushed the point of the needle through the skin of the neck, the foreign body was easily drawn out, and the patient suffered no further inconvenience. The next series represents foreign bodies in the region of the larynx, such as pins, fish-bones, etc., and I would call attention to one in which a very small fish-bone set up severe spasm and could not be seen by ordinary examination, but the X rays revealed it. The bone was

easily removed by means of a probang. I have also brought a series of twelve photographs illustrating the most common situations for coins swallowed by children. They are interesting cases demonstrating the anatomical fact with which we are all familiar—viz., the narrowing of the gullet at the upper part of its course. One of these represents the first coin ever photographed by the X rays, and referred to by Lord Lister in his Presidential Address at the British Association. The last series shows foreign bodies of different kinds in the region of the trachea and lungs; one of these demonstrates the presence of a half sovereign in the right bronchus. The coin has remained in this situation for ten years, and has given the patient no trouble.

Lastly, it may be pointed out in such a discussion as this that it is quite justifiable to suggest general points of interest, although in similar discussions in all congresses the same questions recur and have been dealt with. We are all aware that no subject offers such an opportunity for anecdote and humour, but, setting this aside, many important questions suggest themselves, such as the mental effects upon patients who imagine they are suffering from the effects of foreign bodies and the great variety of bodies which find their way into air-passages. The all-important questions of early detection, the duration which a body may rest within the air-passages followed by slight or serious effects, methods of removal, the sequelæ, feeding of patients while the foreign body remains in the air-passages, relief to breathing, and treatment of the spasms where dyspnœa is threatened, imperfect or careless function in swallowing, are all worthy of your consideration. In mentioning such points one is only too conscious of the fact that it is only possible in opening such a discussion to rapidly indicate points of value for profitable consideration.

Speaking generally, I have only seen one case which proved fatal, and that was in an infant brought to me with cellulitis of the neck, and where several unsuccessful attempts had previously been made to remove the foreign body. In only one case, and that not in my own practice, but in that of one of my colleagues, have I seen it necessary to advise opening the trachea. In this case severe inflammation of the lungs with threatening dyspnœa necessitated this procedure, and the patient made an excellent recovery a few days after the foreign body had been coughed up to the tracheal opening, when it was easily extracted.

